

SEQUENCE LISTING

<110> Judd, Ralph C.
Manning, Scott D.

<120> Omp85 Proteins of *Neisseria gonorrhoeae* and *Neisseria meningitidis*, Compositions Containing Same and Methods of Use Thereof

<130> UMSBC147AUSA

<150> US 09/177,039
<151> 1998-10-22

<160> 8

<170> PatentIn version 3.1

```
<210> 1
<211> 2379
<212> DNA
<213> Neisseria gonorrhoeae
```

<220>
<221> CDS
<222> (1)..(2376)
<223>

<400> 1
atg aaa ctg aaa cag att gcc tcc gca ctg atg atg ttg ggc ata tcg
Met Lys Leu Lys Gln Ile Ala Ser Ala Leu Met Met Leu Gly Ile Ser
1 5 10 15

48

```

cct ttg gca ttt gcc gac ttc acc atc caa gac atc cgt gtc gaa ggc
Pro Leu Ala Phe Ala Asp Phe Thr Ile Gln Asp Ile Arg Val Glu Gly
20          25          30

```

96

ttg cag cgt acc gag ccg agc acc gta ttc aac tac ctg ccc gtc aaa
 Leu Gln Arg Thr Glu Pro Ser Thr Val Phe Asn Tyr Leu Pro Val Lys
 35 40 45

144

```

gtc ggc gac acc tac aac gac aca cac ggc agt gcc atc atc aaa agc
Val Gly Asp Thr Tyr Asn Asp Thr His Gly Ser Ala Ile Ile Lys Ser
      50           55           60

```

192

```

ctg tac gcc acc ggt ttc ttt gac gac gta cga gtc gaa act gcg gac
Leu Tyr Ala Thr Gly Phe Phe Asp Asp Val Arg Val Glu Thr Ala Asp
65           70           75           80

```

240

ggg ctg ctt ctg ctg acc gtt atc gta tgc cct acc atc ggc tcg ctc
 Gly Leu Leu Leu Leu Thr Val Ile Val Cys Pro Thr Ile Gly Ser Leu
 85 90 95

288

aac atc acc ggc gcc aaa atg ctg cag aac gac gcc atc aag aaa aac Asn Ile Thr Gly Ala Lys Met Leu Gln Asn Asp Ala Ile Lys Lys Asn 100 105 110	336
ctc gaa tcg ttc ggg ctg gcg cag tcg caa tac ttt aat cag gcg aca Leu Glu Ser Phe Gly Leu Ala Gln Ser Gln Tyr Phe Asn Gln Ala Thr 115 120 125	384
ctc aac cag gca gtc gcc ggc ctg aaa gaa gaa tat ctc ggg cgc ggc Leu Asn Gln Ala Val Ala Gly Leu Lys Glu Glu Tyr Leu Gly Arg Gly 130 135 140	432
aaa ctc aat atc caa atc acg ccc aaa gta acc aaa ctc gcc cgc aac Lys Leu Asn Ile Gln Ile Thr Pro Lys Val Thr Lys Leu Ala Arg Asn 145 150 155 160	480
cgc gtc gac atc gac atc acg att gac gag ggc aaa tcc gcc aaa atc Arg Val Asp Ile Asp Ile Thr Ile Asp Glu Gly Lys Ser Ala Lys Ile 165 170 175	528
acc gac atc gaa ttt gaa ggc aac caa gtc tat tcc gac cgc aaa ctg Thr Asp Ile Glu Phe Glu Gly Asn Gln Val Tyr Ser Asp Arg Lys Leu 180 185 190	576
atg cgg cag atg tcg ctg acc gaa ggc ggc att tgg aca tgg ctg aca Met Arg Gln Met Ser Leu Thr Glu Gly Gly Ile Trp Thr Trp Leu Thr 195 200 205	624
cga agc gac cgg ttc gac cgc cag aaa ttc gcc caa gac atg gaa aaa Arg Ser Asp Arg Phe Asp Arg Gln Lys Phe Ala Gln Asp Met Glu Lys 210 215 220	672
gta acc gac ttc tac cag aac aac ggc tac ttc gat ttc cgt atc ctc Val Thr Asp Phe Tyr Gln Asn Asn Gly Tyr Phe Asp Phe Arg Ile Leu 225 230 235 240	720
gat acc gac atc caa acc aac gaa gac aaa acc agg cag acc atc aaa Asp Thr Asp Ile Gln Thr Asn Glu Asp Lys Thr Arg Gln Thr Ile Lys 245 250 255	768
atc acc gtc cac gaa ggc gga cgt ttc cgc tgg ggc aaa gtg tcg att Ile Thr Val His Glu Gly Gly Arg Phe Arg Trp Gly Lys Val Ser Ile 260 265 270	816
gaa ggc gac acc aac gaa gtc ccc aag gcc gaa ctg gaa aaa ctg ctg Glu Gly Asp Thr Asn Glu Val Pro Lys Ala Glu Leu Glu Lys Leu Leu 275 280 285	864
acc atg aag ccc ggc aaa tgg tac gaa cgc cag cag atg acc gcc gtt Thr Met Lys Pro Gly Lys Trp Tyr Glu Arg Gln Gln Met Thr Ala Val 290 295 300	912

ttg ggt gag att cag aac cgc atg ggc tcg gca ggc tac gca tac agc Leu Gly Glu Ile Gln Asn Arg Met Gly Ser Ala Gly Tyr Ala Tyr Ser 305 310 315 320	960
gaa atc agc gta cag ccg ctg ccg aac gcc gga acc aaa acc gtc gat Glu Ile Ser Val Gln Pro Leu Pro Asn Ala Gly Thr Lys Thr Val Asp 325 330 335	1008
ttc gtc ctg cac atc gaa ccg ggc aga aaa atc tac gtc aac gaa atc Phe Val Leu His Ile Glu Pro Gly Arg Lys Ile Tyr Val Asn Glu Ile 340 345 350	1056
cac atc acc ggc aac aac aaa acc cgc gac gaa gtc gtg cgc cgc gaa His Ile Thr Gly Asn Asn Lys Thr Arg Asp Glu Val Val Arg Arg Glu 355 360 365	1104
ttg cgc caa atg gaa tcc gcg cct tac gac acc tcc aag ctg caa cgc Leu Arg Gln Met Glu Ser Ala Pro Tyr Asp Thr Ser Lys Leu Gln Arg 370 375 380	1152
tcc aaa gag cgc gtc gag ctt ttg ggc tac ttc gac aac gta cag ttt Ser Lys Glu Arg Val Glu Leu Leu Gly Tyr Phe Asp Asn Val Gln Phe 385 390 395 400	1200
gat gcc gtc ccg ctt gcc ggt acg ccc gac aaa gtc gat ttg aac atg Asp Ala Val Pro Leu Ala Gly Thr Pro Asp Lys Val Asp Leu Asn Met 405 410 415	1248
agc ctg acc gaa cgt tcc acc ggc tcg ctc gac ttg agc gcg ggc tgg Ser Leu Thr Glu Arg Ser Thr Gly Ser Leu Asp Leu Ser Ala Gly Trp 420 425 430	1296
gtt cag gat acc ggc ttg gtc atg tcc gcc ggc gta tcg cag gac aac Val Gln Asp Thr Gly Leu Val Met Ser Ala Gly Val Ser Gln Asp Asn 435 440 445	1344
ctg ttc ggt acg ggc aag tcg gcc gcc ctg cgc gcc tcg cga agc aaa Leu Phe Gly Thr Gly Lys Ser Ala Ala Leu Arg Ala Ser Arg Ser Lys 450 455 460	1392
acc acg ctc aac ggc tcg ctg tcg ttt acc gac ccg tac ttc acg gca Thr Thr Leu Asn Gly Ser Leu Ser Phe Thr Asp Pro Tyr Phe Thr Ala 465 470 475 480	1440
gac ggg gtc agc ctg ggc tac gat att tac gga aaa gcc ttc gac ccg Asp Gly Val Ser Leu Gly Tyr Asp Ile Tyr Gly Lys Ala Phe Asp Pro 485 490 495	1488
cgc aaa gca tcg acc agc gtc aaa caa tat aaa acc acc acc gcc ggc Arg Lys Ala Ser Thr Ser Val Lys Gln Tyr Lys Thr Thr Ala Gly 500 505 510	1536

ggc ggc gta agg atg ggt atc ccc gtt acc gaa tac gac cgc gtc aat Gly Gly Val Arg Met Gly Ile Pro Val Thr Glu Tyr Asp Arg Val Asn 515 520 525	1584
ttc ggg ctg gcg gcg gaa cac ctg acc gtc aac acc tac aac aaa gca Ph Gly Leu Ala Ala Glu His Leu Thr Val Asn Thr Tyr Asn Lys Ala 530 535 540	1632
ccc aaa cgc tat gcc gac ttt atc aaa caa tac ggc aaa acc gac ggc Pro Lys Arg Tyr Ala Asp Phe Ile Lys Gln Tyr Gly Lys Thr Asp Gly 545 550 555 560	1680
gca gac ggc agc ttc aaa ggc ctg ctg tac aaa ggc act gtc ggc tgg Ala Asp Gly Ser Phe Lys Gly Leu Leu Tyr Lys Gly Thr Val Gly Trp 565 570 575	1728
ggg cgc aac aag acc gac agc gcc tta tgg ccg acg cgc ggc tac ctg Gly Arg Asn Lys Thr Asp Ser Ala Leu Trp Pro Thr Arg Gly Tyr Leu 580 585 590	1776
acc ggc gta aat gcc gaa atc gcc ctg ccc ggc agc aaa ctg caa tac Thr Gly Val Asn Ala Glu Ile Ala Leu Pro Gly Ser Lys Leu Gln Tyr 595 600 605	1824
tac tcc gcc acc cac aac caa acc tgg ttc ttc ccc tta agc aaa acc Tyr Ser Ala Thr His Asn Gln Thr Trp Phe Phe Pro Leu Ser Lys Thr 610 615 620	1872
ttc acg ctg atg ctc ggc ggc gaa gtc ggc att gcg ggc ggc tac ggc Phe Thr Leu Met Leu Gly Gly Glu Val Gly Ile Ala Gly Gly Tyr Gly 625 630 635 640	1920
aga acc aaa gaa atc ccc ttc ttt gaa aac ttc tac ggc ggc ggc ctg Arg Thr Lys Glu Ile Pro Phe Phe Glu Asn Phe Tyr Gly Gly Leu 645 650 655	1968
ggt tcg gtg cgc ggc tac gaa agc ggc acg ctc ggc ccg aaa gtg tat Gly Ser Val Arg Gly Tyr Glu Ser Gly Thr Leu Gly Pro Lys Val Tyr 660 665 670	2016
gac gaa tac ggc gaa aaa atc agc tac ggc ggc aac aaa aaa gcc aac Asp Glu Tyr Gly Glu Lys Ile Ser Tyr Gly Gly Asn Lys Lys Ala Asn 675 680 685	2064
gtc tcc gcc gag ctg ctc ttc ccg atg ccc ggt gcg aaa gac gca cgc Val Ser Ala Glu Leu Leu Phe Pro Met Pro Gly Ala Lys Asp Ala Arg 690 695 700	2112
acc gtc cgc ctg agc ctg ttt gcc gac gca ggc agc gtg tgg gac ggc Thr Val Arg Leu Ser Leu Phe Ala Asp Ala Gly Ser Val Trp Asp Gly 705 710 715 720	2160

aga acc tat acc gcc gcc gaa aac ggt aac aac aaa tcg gtt tac tcg 2208
 Arg Thr Tyr Thr Ala Ala Glu Asn Gly Asn Asn Lys Ser Val Tyr Ser
 725 730 735

gaa aac gcg cat aaa tcc acc ttt acc aac gaa ttg cgc tat tcc gcc 2256
 Glu Asn Ala His Lys Ser Thr Phe Thr Asn Glu Leu Arg Tyr Ser Ala
 740 745 750

ggc ggc gcg gtt acc tgg ctc tcg cct ttg ggc ccg atg aaa ttc atc 2304
 Gly Gly Ala Val Thr Trp Leu Ser Pro Leu Gly Pro Met Lys Phe Ile
 755 760 765

tac gcc tac ccg ctg aag aaa aaa ccg gaa gac gaa atc caa cgc ttc 2352
 Tyr Ala Tyr Pro Leu Lys Lys Pro Glu Asp Glu Ile Gln Arg Phe
 770 775 780

caa ttc cag ctc ggc acg acg ttc taa 2379
 Gln Phe Gln Leu Gly Thr Thr Phe
 785 790

<210> 2
 <211> 792
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 2

Met Lys Leu Lys Gln Ile Ala Ser Ala Leu Met Met Leu Gly Ile Ser
 1 5 10 15

Pro Leu Ala Phe Ala Asp Phe Thr Ile Gln Asp Ile Arg Val Glu Gly
 20 25 30

Leu Gln Arg Thr Glu Pro Ser Thr Val Phe Asn Tyr Leu Pro Val Lys
 35 40 45

Val Gly Asp Thr Tyr Asn Asp Thr His Gly Ser Ala Ile Ile Lys Ser
 50 55 60

Leu Tyr Ala Thr Gly Phe Phe Asp Asp Val Arg Val Glu Thr Ala Asp
 65 70 75 80

Gly Leu Leu Leu Leu Thr Val Ile Val Cys Pro Thr Ile Gly Ser Leu
 85 90 95

Asn Ile Thr Gly Ala Lys Met Leu Gln Asn Asp Ala Ile Lys Lys Asn
100 105 110

Leu Glu Ser Phe Gly Leu Ala Gln Ser Gln Tyr Phe Asn Gln Ala Thr
115 120 125

Leu Asn Gln Ala Val Ala Gly Leu Lys Glu Glu Tyr Leu Gly Arg Gly
130 135 140

Lys Leu Asn Ile Gln Ile Thr Pro Lys Val Thr Lys Leu Ala Arg Asn
145 150 155 160

Arg Val Asp Ile Asp Ile Thr Ile Asp Glu Gly Lys Ser Ala Lys Ile
165 170 175

Thr Asp Ile Glu Phe Glu Gly Asn Gln Val Tyr Ser Asp Arg Lys Leu
180 185 190

Met Arg Gln Met Ser Leu Thr Glu Gly Gly Ile Trp Thr Trp Leu Thr
195 200 205

Arg Ser Asp Arg Phe Asp Arg Gln Lys Phe Ala Gln Asp Met Glu Lys
210 215 220

Val Thr Asp Phe Tyr Gln Asn Asn Gly Tyr Phe Asp Phe Arg Ile Leu
225 230 235 240

Asp Thr Asp Ile Gln Thr Asn Glu Asp Lys Thr Arg Gln Thr Ile Lys
245 250 255

Ile Thr Val His Glu Gly Arg Phe Arg Trp Gly Lys Val Ser Ile
260 265 270

Glu Gly Asp Thr Asn Glu Val Pro Lys Ala Glu Leu Glu Lys Leu Leu
275 280 285

Thr Met Lys Pro Gly Lys Trp Tyr Glu Arg Gln Gln Met Thr Ala Val
290 295 300

Leu Gly Glu Ile Gln Asn Arg Met Gly Ser Ala Gly Tyr Ala Tyr Ser
 305 310 315 320

Glu Ile Ser Val Gln Pro Leu Pro Asn Ala Gly Thr Lys Thr Val Asp
 325 330 335

Phe Val Leu His Ile Glu Pro Gly Arg Lys Ile Tyr Val Asn Glu Ile
 340 345 350

His Ile Thr Gly Asn Asn Lys Thr Arg Asp Glu Val Val Arg Arg Glu
 355 360 365

Leu Arg Gln Met Glu Ser Ala Pro Tyr Asp Thr Ser Lys Leu Gln Arg
 370 375 380

Ser Lys Glu Arg Val Glu Leu Leu Gly Tyr Phe Asp Asn Val Gln Phe
 385 390 395 400

Asp Ala Val Pro Leu Ala Gly Thr Pro Asp Lys Val Asp Leu Asn Met
 405 410 415

Ser Leu Thr Glu Arg Ser Thr Gly Ser Leu Asp Leu Ser Ala Gly Trp
 420 425 430

Val Gln Asp Thr Gly Leu Val Met Ser Ala Gly Val Ser Gln Asp Asn
 435 440 445

Leu Phe Gly Thr Gly Lys Ser Ala Ala Leu Arg Ala Ser Arg Ser Lys
 450 455 460

Thr Thr Leu Asn Gly Ser Leu Ser Phe Thr Asp Pro Tyr Phe Thr Ala
 465 470 475 480

Asp Gly Val Ser Leu Gly Tyr Asp Ile Tyr Gly Lys Ala Phe Asp Pro
 485 490 495

Arg Lys Ala Ser Thr Ser Val Lys Gln Tyr Lys Thr Thr Ala Gly
 500 505 510

Gly Gly Val Arg Met Gly Ile Pro Val Thr Glu Tyr Asp Arg Val Asn
515 520 525

Phe Gly Leu Ala Ala Glu His Leu Thr Val Asn Thr Tyr Asn Lys Ala
530 535 540

Pro Lys Arg Tyr Ala Asp Phe Ile Lys Gln Tyr Gly Lys Thr Asp Gly
545 550 555 560

Ala Asp Gly Ser Phe Lys Gly Leu Leu Tyr Lys Gly Thr Val Gly Trp
565 570 575

Gly Arg Asn Lys Thr Asp Ser Ala Leu Trp Pro Thr Arg Gly Tyr Leu
580 585 590

Thr Gly Val Asn Ala Glu Ile Ala Leu Pro Gly Ser Lys Leu Gln Tyr
595 600 605

Tyr Ser Ala Thr His Asn Gln Thr Trp Phe Phe Pro Leu Ser Lys Thr
610 615 620

Phe Thr Leu Met Leu Gly Gly Glu Val Gly Ile Ala Gly Gly Tyr Gly
625 630 635 640

Arg Thr Lys Glu Ile Pro Phe Phe Glu Asn Phe Tyr Gly Gly Leu
645 650 655

Gly Ser Val Arg Gly Tyr Glu Ser Gly Thr Leu Gly Pro Lys Val Tyr
660 665 670

Asp Glu Tyr Gly Glu Lys Ile Ser Tyr Gly Gly Asn Lys Lys Ala Asn
675 680 685

Val Ser Ala Glu Leu Leu Phe Pro Met Pro Gly Ala Lys Asp Ala Arg
690 695 700

Thr Val Arg Leu Ser Leu Phe Ala Asp Ala Gly Ser Val Trp Asp Gly
705 710 715 720

Arg Thr Tyr Thr Ala Ala Glu Asn Gly Asn Asn Lys Ser Val Tyr Ser
 725 730 735

Glu Asn Ala His Lys Ser Thr Phe Thr Asn Glu Leu Arg Tyr Ser Ala
 740 745 750

Gly Gly Ala Val Thr Trp Leu Ser Pro Leu Gly Pro Met Lys Phe Ile
 755 760 765

Tyr Ala Tyr Pro Leu Lys Lys Lys Pro Glu Asp Glu Ile Gln Arg Phe
 770 775 780

Gln Phe Gln Leu Gly Thr Thr Phe
 785 790

<210> 3
 <211> 2394
 <212> DNA
 <213> Neisseria meningitidis

<220>
 <221> CDS
 <222> (1)..(2391)
 <223>

<400> 3			
atg aaa ctg aaa cag att gct tcc gca ctg atg atg ttg ggc ata tcg			48
Met Lys Leu Lys Gln Ile Ala Ser Ala Leu Met Met Leu Gly Ile Ser			
1 5 10 15			
cct ttg gca ttt gcc gac ttc acc atc caa gac atc cgt gtc gaa ggc			96
Pro Leu Ala Phe Ala Asp Phe Thr Ile Gln Asp Ile Arg Val Glu Gly			
20 25 30			
ttg cag cgt acc gag ccg agc acc gta ttc aac tac ctg ccc gtc aaa			144
Leu Gln Arg Thr Glu Pro Ser Thr Val Phe Asn Tyr Leu Pro Val Lys			
35 40 45			
gtc ggc gat acc tac aac gac aca cac ggc agt gcc atc atc aaa agc			192
Val Gly Asp Thr Tyr Asn Asp Thr His Gly Ser Ala Ile Ile Lys Ser			
50 55 60			
ctg tac gcc acc ggt ttc ttt gac gac gta cgc gtc gaa act gcg gac			240
Leu Tyr Ala Thr Gly Phe Phe Asp Asp Val Arg Val Glu Thr Ala Asp			
65 70 75 80			

ggg cag ctc ctg ctg acc gtt atc gaa cgc ccc acc atc ggc tcg ctc	288
Gly Gln Leu Leu Leu Thr Val Ile Glu Arg Pro Thr Ile Gly Ser Leu	
85 90 95	
aac atc acc ggc gca aaa atg ctg caa aac gac gcc att aag aaa aac	336
Asn Ile Thr Gly Ala Lys Met Leu Gln Asn Asp Ala Ile Lys Lys Asn	
100 105 110	
ctc gaa tcg ttc ggg ctg gcg cag tcg caa tac ttt aat cag gcg aca	384
Leu Glu Ser Phe Gly Leu Ala Gln Ser Gln Tyr Phe Asn Gln Ala Thr	
115 120 125	
ctc aat cag gca gtc gcc ggc ctg aaa gaa gaa tac ctc ggg cgc ggc	432
Leu Asn Gln Ala Val Ala Gly Leu Lys Glu Glu Tyr Leu Gly Arg Gly	
130 135 140	
aaa ctc aat atc caa atc acg ccc aaa gta acc aaa ctc gcc cgc aac	480
Lys Leu Asn Ile Gln Ile Thr Pro Lys Val Thr Lys Leu Ala Arg Asn	
145 150 155 160	
cgc gtc gac atc gac atc acg att gac gag ggc aaa tcc gcc aaa atc	528
Arg Val Asp Ile Asp Ile Thr Ile Asp Glu Gly Lys Ser Ala Lys Ile	
165 170 175	
acc gac atc gaa ttt gaa ggc aac caa gtc tat tcc gac cgc aaa ctg	576
Thr Asp Ile Glu Phe Glu Gly Asn Gln Val Tyr Ser Asp Arg Lys Leu	
180 185 190	
atg cgg cag atg tcg ctg acc gaa ggc ggc att tgg aca tgg ctg aca	624
Met Arg Gln Met Ser Leu Thr Glu Gly Gly Ile Trp Thr Trp Leu Thr	
195 200 205	
cga agc aac caa ttc aac gag cag aaa ttt gcc caa gac atg gaa aaa	672
Arg Ser Asn Gln Phe Asn Glu Gln Lys Phe Ala Gln Asp Met Glu Lys	
210 215 220	
gta acc gac ttc tac cag aac aac ggc tac ttc gat ttc cgt atc ctc	720
Val Thr Asp Phe Tyr Gln Asn Asn Gly Tyr Phe Asp Phe Arg Ile Leu	
225 230 235 240	
gat acc gac atc caa acc aac gaa gac aaa acc aag cag acc atc aaa	768
Asp Thr Asp Ile Gln Thr Asn Glu Asp Lys Thr Lys Gln Thr Ile Lys	
245 250 255	
atc acc gtc cac gaa ggc gga cgt ttc cgt tgg ggc aaa gtc tcc atc	816
Ile Thr Val His Glu Gly Gly Arg Phe Arg Trp Gly Lys Val Ser Ile	
260 265 270	
gaa ggc gac acc aac gaa gtc ccc aaa gcc gaa ctg gaa aaa ctg ctg	864
Glu Gly Asp Thr Asn Glu Val Pro Lys Ala Glu Leu Glu Lys Leu Leu	
275 280 285	

acc atg aag ccc ggc aaa tgg tac gaa cgc cag cag atg acc gcc gtt	912
Thr Met Lys Pro Gly Lys Trp Tyr Glu Arg Gln Gln Met Thr Ala Val	
290 295 300	
ttg ggt gag att cag aac cgc atg ggc tcg gca ggc tac gca tac agc	960
Leu Gly Glu Ile Gln Asn Arg Met Gly Ser Ala Gly Tyr Ala Tyr Ser	
305 310 315 320	
gaa atc agc gta cag ccg ctg cca aac gcc gaa acc aaa acc gtc gat	1008
Glu Ile Ser Val Gln Pro Leu Pro Asn Ala Glu Thr Lys Thr Val Asp	
325 330 335	
ttc gtc ctg cac atc gaa ccg ggc cgg aaa atc tac gtc aac gaa atc	1056
Phe Val Leu His Ile Glu Pro Gly Arg Lys Ile Tyr Val Asn Glu Ile	
340 345 350	
cac atc acc ggc aac aac aaa acc cgc gac gaa gtc gtg cgc cgc gaa	1104
His Ile Thr Gly Asn Asn Lys Thr Arg Asp Glu Val Val Arg Arg Glu	
355 360 365	
ttg cgc caa atg gaa tcc gcg cct tac gac acc tcc aag ctg caa cgc	1152
Leu Arg Gln Met Glu Ser Ala Pro Tyr Asp Thr Ser Lys Leu Gln Arg	
370 375 380	
tcc aaa gag cgc gtc gag ctt ttg ggc tac ttc gac aac gta cag ttt	1200
Ser Lys Glu Arg Val Glu Leu Leu Gly Tyr Phe Asp Asn Val Gln Phe	
385 390 395 400	
gat gcc gtc ccg ctt gcc ggc aca ccc gac aaa gtc gat ttg aac atg	1248
Asp Ala Val Pro Leu Ala Gly Thr Pro Asp Lys Val Asp Leu Asn Met	
405 410 415	
agc ctg acc gaa cgt tcc acc ggc tcg ctc gac ttg agc gcg ggc tgg	1296
Ser Leu Thr Glu Arg Ser Thr Gly Ser Leu Asp Leu Ser Ala Gly Trp	
420 425 430	
gta cag gat acc ggc ctg gtc atg tcc gca ggc gtt tcc caa gac aac	1344
Val Gln Asp Thr Gly Leu Val Met Ser Ala Gly Val Ser Gln Asp Asn	
435 440 445	
ctg ttc ggt acg ggc aag tcg gcc gcc ctg cgc gcc tca cga agc aaa	1392
Leu Phe Gly Thr Gly Lys Ser Ala Ala Leu Arg Ala Ser Arg Ser Lys	
450 455 460	
acc acg ctc aac ggc tcg ctg tcg ttt acc gac ccg tac ttc acg gca	1440
Thr Thr Leu Asn Gly Ser Leu Ser Phe Thr Asp Pro Tyr Phe Thr Ala	
465 470 475 480	
gac ggg gtc agc ctg ggc tac gat gtt tac gga aaa gcc ttc gac ccg	1488
Asp Gly Val Ser Leu Gly Tyr Asp Val Tyr Gly Lys Ala Phe Asp Pro	
485 490 495	

cgc aaa gca tcg acc agc atc aaa caa tat aaa acc acc acg gca ggc Arg Lys Ala Ser Thr Ser Ile Lys Gln Tyr Lys Thr Thr Ala Gly 500 505 510	1536
gca ggc atc cg ^c atg agc gtg cct gtt acc gaa tac gac cg ^c gtg aat Ala Gly Ile Arg Met Ser Val Pro Val Thr Glu Tyr Asp Arg Val Asn 515 520 525	1584
ttc ggt ttg gtg gca gaa cac ctg acc gtc aac acc tac aac aaa gcg Phe Gly Leu Val Ala Glu His Leu Thr Val Asn Thr Tyr Asn Lys Ala 530 535 540	1632
ccc aaa cac tat gcc gac ttt atc aag aaa tac ggc aaa acc gac ggc Pro Lys His Tyr Ala Asp Phe Ile Lys Tyr Gly Lys Thr Asp Gly 545 550 555 560	1680
aca gac ggc agc ttc aaa ggc tgg ctg tac aaa ggt acc gtc ggc tgg Thr Asp Gly Ser Phe Lys Gly Trp Leu Tyr Lys Gly Thr Val Gly Trp 565 570 575	1728
ggg cg ^c aac aaa acc gac agc gcg tta tgg ccg acg cg ^c ggc tac ctg Gly Arg Asn Lys Thr Asp Ser Ala Leu Trp Pro Thr Arg Gly Tyr Leu 580 585 590	1776
acg ggc gtg aac gcc gaa atc gcc ctg ccc ggc agc aaa ctg caa tac Thr Gly Val Asn Ala Glu Ile Ala Leu Pro Gly Ser Lys Leu Gln Tyr 595 600 605	1824
tac tcc gcc acc cac aac caa acc tgg ttc ttc ccc tta agc aaa acc Tyr Ser Ala Thr His Asn Gln Thr Trp Phe Phe Pro Leu Ser Lys Thr 610 615 620	1872
ttc acg ctg atg ctc ggc ggc gaa gtc ggc att gcg ggc ggc tac ggc Phe Thr Leu Met Leu Gly Gly Glu Val Gly Ile Ala Gly Gly Tyr Gly 625 630 635 640	1920
aga acc aaa gaa atc ccc ttc ttt gaa aac ttc tac ggc ggc ggc ctg Arg Thr Lys Glu Ile Pro Phe Phe Glu Asn Phe Tyr Gly Gly Leu 645 650 655	1968
ggt tcg gtg cg ^c gga tac gaa agc ggc acg ctc ggt ccg aaa gtg tat Gly Ser Val Arg Gly Tyr Glu Ser Gly Thr Leu Gly Pro Lys Val Tyr 660 665 670	2016
gac gaa tac ggc gaa aaa atc agc tac ggc ggc aac aaa aaa gcc aac Asp Glu Tyr Gly Glu Lys Ile Ser Tyr Gly Gly Asn Lys Lys Ala Asn 675 680 685	2064
gtc tcc gcc gag ctg ctc ttc ccg atg cct ggc ggc aaa gac ggc cg ^c Val Ser Ala Glu Leu Leu Phe Pro Met Pro Gly Ala Lys Asp Ala Arg 690 695 700	2112

acc gtc cgc ctg agc ctg ttt gcc gac gca ggc agc gtg tgg gac ggc Thr Val Arg Leu Ser Leu Phe Ala Asp Ala Gly Ser Val Trp Asp Gly 705 710 715 720	2160
aaa acc tac gac gac aac agc agt tcc gcg acc ggc ggc agg gtt caa Lys Thr Tyr Asp Asp Asn Ser Ser Ala Thr Gly Gly Arg Val Gln 725 730 735	2208
aac att tac ggc gcc ggc aat acc cat aaa tcc acc ttt acc aac gaa Asn Ile Tyr Gly Ala Gly Asn Thr His Lys Ser Thr Phe Thr Asn Glu 740 745 750	2256
ttg cgc tat tcc gcc ggc ggc gcg gtt acc tgg ctc tcg cct tta ggc Leu Arg Tyr Ser Ala Gly Gly Ala Val Thr Trp Leu Ser Pro Leu Gly 755 760 765	2304
ccg atg aaa ttc agg tac gcc tac ccg ctg aag aaa aaa ccg gaa gac Pro Met Lys Phe Arg Tyr Ala Tyr Pro Leu Lys Lys Lys Pro Glu Asp 770 775 780	2352
gaa atc caa cgc ttc caa ttc caa ctc ggc acg acg ttc taa Glu Ile Gln Arg Phe Gln Phe Gln Leu Gly Thr Thr Phe 785 790 795	2394
<210> 4	
<211> 797	
<212> PRT	
<213> Neisseria meningitidis	
<400> 4	
Met Lys Leu Lys Gln Ile Ala Ser Ala Leu Met Met Leu Gly Ile Ser 1 5 10 15	
Pro Leu Ala Phe Ala Asp Phe Thr Ile Gln Asp Ile Arg Val Glu Gly 20 25 30	
Leu Gln Arg Thr Glu Pro Ser Thr Val Phe Asn Tyr Leu Pro Val Lys 35 40 45	
Val Gly Asp Thr Tyr Asn Asp Thr His Gly Ser Ala Ile Ile Lys Ser 50 55 60	
Leu Tyr Ala Thr Gly Phe Phe Asp Asp Val Arg Val Glu Thr Ala Asp 65 70 75 80	

Gly Gln Leu Leu Leu Thr Val Ile Glu Arg Pro Thr Ile Gly Ser Leu
85 90 95

Asn Ile Thr Gly Ala Lys Met Leu Gln Asn Asp Ala Ile Lys Lys Asn
100 105 110

Leu Glu Ser Phe Gly Leu Ala Gln Ser Gln Tyr Phe Asn Gln Ala Thr
115 120 125

Leu Asn Gln Ala Val Ala Gly Leu Lys Glu Glu Tyr Leu Gly Arg Gly
130 135 140

Lys Leu Asn Ile Gln Ile Thr Pro Lys Val Thr Lys Leu Ala Arg Asn
145 150 155 160

Arg Val Asp Ile Asp Ile Thr Ile Asp Glu Gly Lys Ser Ala Lys Ile
165 170 175

Thr Asp Ile Glu Phe Glu Gly Asn Gln Val Tyr Ser Asp Arg Lys Leu
180 185 190

Met Arg Gln Met Ser Leu Thr Glu Gly Ile Trp Thr Trp Leu Thr
195 200 205

Arg Ser Asn Gln Phe Asn Glu Gln Lys Phe Ala Gln Asp Met Glu Lys
210 215 220

Val Thr Asp Phe Tyr Gln Asn Asn Gly Tyr Phe Asp Phe Arg Ile Leu
225 230 235 240

Asp Thr Asp Ile Gln Thr Asn Glu Asp Lys Thr Lys Gln Thr Ile Lys
245 250 255

Ile Thr Val His Glu Gly Arg Phe Arg Trp Gly Lys Val Ser Ile
260 265 270

Glu Gly Asp Thr Asn Glu Val Pro Lys Ala Glu Leu Glu Lys Leu Leu
275 280 285

Thr Met Lys Pro Gly Lys Trp Tyr Glu Arg Gln Gln Met Thr Ala Val
 290 295 300

Leu Gly Glu Ile Gln Asn Arg Met Gly Ser Ala Gly Tyr Ala Tyr Ser
 305 310 315 320

Glu Ile Ser Val Gln Pro Leu Pro Asn Ala Glu Thr Lys Thr Val Asp
 325 330 335

Phe Val Leu His Ile Glu Pro Gly Arg Lys Ile Tyr Val Asn Glu Ile
 340 345 350

His Ile Thr Gly Asn Asn Lys Thr Arg Asp Glu Val Val Arg Arg Glu
 355 360 365

Leu Arg Gln Met Glu Ser Ala Pro Tyr Asp Thr Ser Lys Leu Gln Arg
 370 375 380

Ser Lys Glu Arg Val Glu Leu Leu Gly Tyr Phe Asp Asn Val Gln Phe
 385 390 395 400

Asp Ala Val Pro Leu Ala Gly Thr Pro Asp Lys Val Asp Leu Asn Met
 405 410 415

Ser Leu Thr Glu Arg Ser Thr Gly Ser Leu Asp Leu Ser Ala Gly Trp
 420 425 430

Val Gln Asp Thr Gly Leu Val Met Ser Ala Gly Val Ser Gln Asp Asn
 435 440 445

Leu Phe Gly Thr Gly Lys Ser Ala Ala Leu Arg Ala Ser Arg Ser Lys
 450 455 460

Thr Thr Leu Asn Gly Ser Leu Ser Phe Thr Asp Pro Tyr Phe Thr Ala
 465 470 475 480

Asp Gly Val Ser Leu Gly Tyr Asp Val Tyr Gly Lys Ala Phe Asp Pro
 485 490 495

Arg Lys Ala Ser Thr Ser Ile Lys Gln Tyr Lys Thr Thr Thr Ala Gly
500 505 510

Ala Gly Ile Arg Met Ser Val Pro Val Thr Glu Tyr Asp Arg Val Asn
515 520 525

Phe Gly Leu Val Ala Glu His Leu Thr Val Asn Thr Tyr Asn Lys Ala
530 535 540

Pro Lys His Tyr Ala Asp Phe Ile Lys Lys Tyr Gly Lys Thr Asp Gly
545 550 555 560

Thr Asp Gly Ser Phe Lys Gly Trp Leu Tyr Lys Gly Thr Val Gly Trp
565 570 575

Gly Arg Asn Lys Thr Asp Ser Ala Leu Trp Pro Thr Arg Gly Tyr Leu
580 585 590

Thr Gly Val Asn Ala Glu Ile Ala Leu Pro Gly Ser Lys Leu Gln Tyr
595 600 605

Tyr Ser Ala Thr His Asn Gln Thr Trp Phe Phe Pro Leu Ser Lys Thr
610 615 620

Phe Thr Leu Met Leu Gly Gly Glu Val Gly Ile Ala Gly Gly Tyr Gly
625 630 635 640

Arg Thr Lys Glu Ile Pro Phe Phe Glu Asn Phe Tyr Gly Gly Leu
645 650 655

Gly Ser Val Arg Gly Tyr Glu Ser Gly Thr Leu Gly Pro Lys Val Tyr
660 665 670

Asp Glu Tyr Gly Glu Lys Ile Ser Tyr Gly Gly Asn Lys Lys Ala Asn
675 680 685

Val Ser Ala Glu Leu Leu Phe Pro Met Pro Gly Ala Lys Asp Ala Arg
690 695 700

Thr Val Arg Leu Ser Leu Phe Ala Asp Ala Gly Ser Val Trp Asp Gly
 705 710 715 720

Lys Thr Tyr Asp Asp Asn Ser Ser Ala Thr Gly Gly Arg Val Gln
 725 730 735

Asn Ile Tyr Gly Ala Gly Asn Thr His Lys Ser Thr Phe Thr Asn Glu
 740 745 750

Leu Arg Tyr Ser Ala Gly Gly Ala Val Thr Trp Leu Ser Pro Leu Gly
 755 760 765

Pro Met Lys Phe Arg Tyr Ala Tyr Pro Leu Lys Lys Lys Pro Glu Asp
 770 775 780

Glu Ile Gln Arg Phe Gln Phe Gln Leu Gly Thr Thr Phe
 785 790 795

<210> 5
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> PCR primer

<400> 5
 cggaaattcat gaaaactgaaa cag

23

<210> 6
 <211> 18
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> PCR primer

<400> 6
 ttgcagtttt tgcaattc

18

<210> 7
 <211> 59
 <212> DNA

<213> *Neisseria gonorrhoeae*

<400> 7

tagattttac gtttcggaat gcagtctgaa accgcattcc gcaccacaag gaacttacg 59

<210> 8

<211> 67

<212> DNA

<213> *Neisseria gonorrhoeae*

<400> 8

cccgcaaatg ccgtctgaag cccttgagac ggcatttcgc ggcaacatcc gaaggagtt 60

taccatg

67